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**Prevalence of tobacco, cocaine and alcohol use amongst patients attending for
Methadone-Maintenance Therapy in a rural setting**

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Prevalence of tobacco, cocaine and alcohol use amongst patients attending for Methadone-Maintenance Therapy in a rural setting

Background: Patients receiving methadone-maintenance therapy appear more likely to have other substance-use disorders than do people in the general population and often fail to receive treatment for these conditions. Coexisting substance-use disorders are associated with poor health outcomes amongst current or former heroin users. The aim of this study was to establish the prevalence of the use of tobacco, cocaine and alcohol amongst patients attending for community-based methadone-maintenance therapy. **Methods:** Cross-sectional survey of patients prescribed methadone as to treat opiate dependence. **Results:** Prevalence of tobacco, cocaine and alcohol use in the sample were 91.18%, 11.18% and 42.01%, respectively. Most respondents were found to be dependent upon tobacco. In contrast, most patients were found to have no dependence upon alcohol. In total, 145 patients (85.80%) had Alcohol Use Disorders Identification Test PC (AUDIT PC) scores below 5, indicating lower risk drinking, while the remaining 24 (14.20%) had AUDIT scores of 5 or above, indicating higher risk drinking. **Conclusions:** There are higher rates of self-reported tobacco, cocaine and alcohol use disorders amongst methadone-maintained individuals than those reported in individuals from the general population. The findings illustrate the importance of identifying coexisting tobacco, cocaine and alcohol use disorders in methadone-maintained patients, since these issues can significantly impair patients' quality of life and affect treatment outcomes.

Keywords: Methadone, Alcohol, Tobacco, Cocaine, Prevalence

Prevalence of tobacco, cocaine and alcohol use amongst patients attending for Methadone-Maintenance Therapy in a rural setting

Background

While opiate substitute treatment has proven to be effective in decreasing substance misuse, clients may not stop all drug use immediately after entering treatment; rather, eradicating all illicit drug and alcohol misuse may take months or years (Department of Health, 2007). Despite this, there are studies corroborating a decrease in the use of heroin and other illicit substances amongst individuals receiving methadone-maintenance treatment (Ward, Hall, & Mattick, 1999). The coexisting use of substances such as cocaine can affect the programme's effectiveness, as has been demonstrated in observational studies (Ward et al., 1999). It is generally agreed that the stabilisation of one pattern of drug misuse may still be associated with the ongoing problematic use of other substances, and this presents a challenge both to staff and for programme delivery. The substances most frequently misused are tobacco and alcohol (Farrell et al., 1994).

A variety of factors that play a role in the increased rate of tobacco use amongst methadone-maintained patients have been identified: While some smoke to counteract methadone taste and withdrawal, others do so as a part of the drug use ritual and to manage drug-induced behaviours. It has been suggested that methadone and smoking use may be a reciprocally enhanced behaviour, since some tobacco users may use methadone to counteract the side effects of smoking, and in some cases where there is sore throat associated with heavy tobacco use, smokers may use methadone in order to continue smoking (McCool & Richter, 2003).

Individuals receiving methadone treatment for opiate dependence drink more alcohol than similar age groups in the general population, but their alcohol intake is not higher than opioid-dependent persons who are not receiving opiate replacement therapy (Hunt et al., 1986). While some studies have identified heavy alcohol consumption in up to half of all patients in methadone maintenance (Kreek, 1990), others have reported that approximately 33% of methadone-maintained patients have current drinking problems and one-sixth have a history of a drinking problem (Senbanjo, Wolff, & Marshall, 2007). This trend is cause for concern, since greater psychosocial pathology, elevated rates of treatment failure and increased criminal activity are related with alcohol misuse (Best et al., 1998). Therefore, estimating the prevalence for these coexisting conditions is a fundamental procedure, since overlooking such needs may produce an adverse impact on overall treatment and outcome. The latest estimated prevalence of alcohol use among adults in the general population of Great Britain, according to the 2009 General Lifestyle Survey, is 85% of adults in the general population (Robinson & Harris, 2009).

While the prevalence of cocaine use in the general population between 16 and 59 years of age in the UK is 2.2% (Home Office, 2011), the prevalence of current cocaine use amongst methadone-maintained individuals has been found to be significantly higher than prevalence of cocaine use in the general population. A survey by Hasin, Grant, Endicott and Harford (1988) found a prevalence of 92% of cocaine use in a group of heroin users not engaged in methadone treatment (Hasin, Grant, Endicott, & Harford, 1988). Correspondingly, elevated rates of illicit cocaine use have been detected in heroin-dependent individuals receiving methadone-

maintenance therapy during the continuation of treatment (Leri, Stewart, Tremblay, & Bruneau, 2004). A study by Hartel et al. (1995) found a prevalence of cocaine use of 51.7% amongst patients receiving methadone-maintenance treatment (Hartel et al., 1995). A survey by Magura, Kang, Nwakeze and Demsky (1998) found that 73% of 1,038 patients receiving methadone therapy tested positive for cocaine on urinalysis (Magura, Kang, Nwakeze, & Demsky, 1998). Another study reported that 50% of methadone-maintained patients were positive for cocaine (Grella, Anglin, & Wugalter, 1997), and Black et al (1987) confirmed that in a group of methadone-maintained individuals, the results were positive in 63% of the samples screened for the cocaine metabolite benzoylecgonine (Black, Dolan, Penk, Robinowitz, & Deford, 1987). As methadone is not a pharmacological therapy for cocaine, a direct relationship between methadone dose and cocaine use is not to be expected. It has been reported that cocaine use accelerates methadone elimination (Moolchan, Umbricht, & Epstein, 2001); therefore, methadone-maintained patients who also use cocaine may need increased amounts of methadone to reach therapeutic levels as an opiate substitute treatment.

While methadone-maintenance treatment may produce a positive impact on illicit drug-related outcomes, research indicates that general lifestyle and health problems may continue or even increase (Best et al., 1998). As coexisting substance-use disorders are especially associated with general lifestyle and health problems amongst current or former heroin users (Patton, Smythe, Kelsall, & Selemo, 2007), estimating the prevalence of patients with these coexisting substance-use disorders is an essential procedure, since overlooking these needs can have a negative influence on overall treatment and outcome. To that end, the present study investigates the prevalence of

the use of tobacco, cocaine and alcohol amongst adult substance misusers attending for community-based methadone-maintenance therapy in a rural setting.

Methods

This is a cross-sectional survey of drug users aged over 18 years presenting to specialist drug services in East Kent. These services were provided by a voluntary agency, KCA (Kent Counselling for Addictions) UK. East Kent is mainly a rural area, with a population of about 624,000 and at the time of the study about 800 patients were in treatment for opiate dependence. The majority of these methadone-maintained patients (an estimated 80%) are supervised daily by a community pharmacist. The remaining patients are allowed partial take-home doses of methadone with supervised consumption at least once weekly.

All clients attending KCA services who met ICD-10 criteria for opiate dependence, who were stabilised on methadone treatment for at least two months and who were not under the effects of drugs or alcohol and were not displaying withdrawal symptoms were eligible to participate in the survey. Patients who met these inclusion criteria were approached by their designated community drug worker and asked to participate in the study during key working sessions and after clinic appointments. They were given an information sheet with detailed information about the study; once they indicated that this information was clear to them, they completed the questionnaire. The participants did not receive payment as an incentive for taking part in the study. The entire procedure lasted about 30 minutes for each participant. Ethical approval for the study was given by the local NHS REC.

The study questionnaire consisted of socio-demographic data and a battery of brief, reliable and validated instruments described below. The main variables measured were alcohol use, harmful use and dependence, tobacco use and dependence, and cocaine use and dependence. The following questionnaires were used: The severity of dependence scales (SDS) (Gossop et al., 1995), The Severity of Alcohol Dependence Questionnaire (SADQ-C) – Community version (Stockwell, Sitharthan, Mcgrath, & Lang, 1994; Stockwell, Murphy, & Hodgson, 1983), and The Alcohol Use Disorders Identification Test (AUDIT) – Primary Care version (Gomez, Conde, Santana, & Jorin, 2005; Saunders, Aasland, Babor, Delafuente, & Grant, 1993).

Dependence upon tobacco and cocaine was assessed using the SDS, and the SADQ-C scale was used for alcohol dependence. For the SDS, scores of 4+ were considered indicative of dependence. For the SADQ-C, scores less than 4 indicated no dependence, scores between 4 and 19 indicated mild dependence, scores between 20 and 30 indicated moderate dependence, scores between 31 and 44 indicated severe dependence, and scores of 45 or above indicated very severe dependence. Alcohol use and dependency was also measured by the AUDIT PC questionnaire. AUDIT PC scores of five or above were used to indicate hazardous drinking.

Results

The recruitment of participants was carried out over a four month period. A total of 170 patients were invited to take part in the study. No patients declined, giving a participation rate of 100%. Most respondents were male (61.76%) and white British (88.82%). About a quarter of all respondents (23.5%) indicated that they were engaged in some form of paid employment, with rest on sickness (46.5%) or unemployment benefits (23.0%).

The SDS and AUDIT PC were used to estimate the total number and percentage of respondents who were current users of tobacco, cocaine and alcohol. The results indicated that the vast majority of respondents (91.2%) were current tobacco users, with 11.2% using cocaine and 42% alcohol.

The majority of patients who used tobacco were found to be dependent upon it (91.6% of all tobacco smokers; 83.5% of sample). A small number (n=17, 89.5% of all cocaine users; 10.00% of sample) were found to be dependent upon cocaine. In total, four patients (5.6% of all alcohol users; 2.37% of sample) were moderately dependent upon alcohol, with six respondents indicating severe dependence (8.5% of all alcohol users; 3.55% of sample). Twenty-four respondents (33.8% of all alcohol users; 14.20% of sample) indicated hazardous or higher risk drinking.

Discussion

The present study assessed the prevalence of coexisting substance disorders in methadone-maintained individuals. It was found that the estimated prevalence of tobacco, cocaine and alcohol use in the sample were 91.2%, 11.2% and 42.0%,

respectively. Such rates are comparable with previously published data: Chun et al (2009) identified a tobacco prevalence of 95% (Chun, Haug, Guydish, Sorensen, & Delucchi, 2009). Best et al. (1998) reported alcohol prevalence rates between 20% and 50% in a group of individuals receiving methadone-maintenance treatment (Best et al., 1998). The prevalence of cocaine use found in the present study in methadone-maintained individuals was 11.11%, and this is notably lower than the prevalence reported in previous studies (Hartel et al., 1995; Magura et al., 1998; Grella et al., 1997), which indicated a prevalence of between 50% and 73%. A plausible explanation for this may be that adults living in mainly rural communities such as East Kent are expected to experience less use of Class A drugs than those living in urban areas. This explanation may be reinforced by the findings of the British Crime Survey, which found that 9.3% of adults living in urban areas used illicit drugs, whereas the rate of illicit drug use of those living in rural areas was 7.0% (Home Office, 2011).

The prevalence of tobacco use identified in this study, 91.8%, supports the claim that the prevalence of smoking among patients receiving methadone-maintenance treatment can be three to four times that of the general population (Sobell, Sobell, & Agrawal, 2002). This was the finding of the present study, since the prevalence of smoking tobacco amongst individuals in the general population in Great Britain is 21% or higher after adjustments for non-detection through misreports of tobacco smoking. The tobacco prevalence shown in the present study is also consistent with published data showing that the smoking rate for people in methadone treatment is over 90% (Shadel et al., 2005) and supporting the statement that amongst all kinds of drug treatments, higher tobacco prevalence has been described for methadone-

maintained individuals (Clemmey, Brooner, Chutuape, Kidorf, & Stitzer, 1997). In the present study, the majority of respondents (83.53%) were found to be dependent upon tobacco.

Since the vast majority of methadone-maintained individuals smoke, it is expected that they will experience high levels tobacco-related morbidity and mortality (Richter & Ahluwalia, 2000). Nevertheless, drug treatment programmes normally do not include smoking cessation activities as these are considered a low treatment priority due to misconceptions that offering such interventions are ineffective upon this population, and could reduce attendances to services (Chun et al., 2009). Previous research has found that only one out of three services provide tobacco counselling, and just one out of ten offer nicotine replacement therapy (Richter, Choi, Mccool, Harris, & Ahluwalia, 2004).

It has been stated that the continuous use of tobacco leads to a dependence comparable to those resulting from the use of other drugs, with similar factors that influence initiation, abstinence and relapse (Henningfield, Clayton, & Pollin, 1990). A variety of factors that play a role in the increased rate of tobacco use amongst methadone-maintained patients have been identified. While some smoke to counteract methadone taste and withdrawal, others do so as a part of the drug use ritual and to manage drug-induced behaviours. It has been suggested that methadone and smoking use may be a reciprocally enhanced behaviour, since some tobacco users may use methadone to counteract the side effects of smoking, and in some cases where there is sore throat associated with heavy tobacco use, smokers may use methadone in order to continue smoking (Mccool & Richter, 2003) .

It has been reported that there is an association between methadone and nicotine in methadone-maintained participants who consumed more methadone; one study observed the effects of nicotine abstinence, ad libitum smoking and three different concentrations of nicotine gums on methadone self-administration. The individuals used more methadone in ad libitum smoking conditions than they did when following the abstinence condition (Spiga, Schmitz, & Day, 1998). Although the results of this survey suggest that there is a relationship between nicotine and methadone usage, causality remains uncertain.

The elevated degree of their coexistence implies that opiates and nicotine not only share related environmental and societal risk factors, but also physiological interactions that add to the beginning and continuation of dependence. Methadone and nicotine produce positive mood changes after their consumption; they also produce similar physiological results and symptoms, for example, certain mood disturbances, anxiety and sleeping problems (Hughes, Higgins, & Bickel, 1994). Nicotine and methadone seem to act on neurons that use dopamine as a neurotransmitter, and these cells are thought to play a role in the development of dependence (Gardier, 1997). Opioids and nicotine alter biochemical processes and therefore human behaviours. Opiate and tobacco dependence could be consequences of opiate and tobacco biochemical actions as well as the societal background in which illicit drug misuse occurs.

Methadone and tobacco may have certain similarities, but they also have significant differences. Methadone is transported in a single dose, reaching a maximum level six

hours after use, which then falls continuously until 24 hours. On the other hand, nicotine is delivered in little quantities that reach the central nervous system rapidly and undergo rapid clearance in a period of 24 hours (Hiltunen et al., 1995). Moreover, oral methadone produces sedative effects, but nicotine acts as a stimulant; these antagonist actions may induce tobacco users to use tobacco as stimulant with the aim of counteracting the sedative properties from oral methadone by titrating nicotine levels as a response to increases in methadone doses and the day-to-day highest serum levels of methadone (Preston, 1996). Equally, the stimulating properties of tobacco may be neutralised by oral methadone (Richter & Ahluwalia, 2000). This should be considered in daily clinical practice when prescribing methadone, as it can be seen empirically in many cases that many methadone-maintained individuals increase tobacco consumption following commencement and increase of dosage during titration, and their tobacco use also drops when they are detoxified in the community.

All the information explained above generates a greater understanding of the issues involved when delivering tobacco cessation interventions to methadone-maintained individuals and may serve the purpose of delivering brief, on-site interventions that will hopefully aid in the goal of decreasing tobacco-related mortality, decreasing coexisting drug use and increasing the health outcomes of methadone-maintained individuals.

The prevalence of cocaine use found in this study, at 11%, is higher than that found in the general adult population in the England & Wales, which is 2.2% (Home Office, 2011). This finding was expected, as it has been recorded that higher rates of cocaine

use in methadone-maintained individuals is an area of concern (Maremmanni et al., 2007). Despite this, the prevalence of cocaine use in methadone-maintained individuals in this study is not as high as reported in other studies conducted amongst such individuals. Some have reported values from 51.67% (Hartel et al., 1995) to 73% (Magura et al., 1998). This may be due to the factor explained above, namely that adults living in mainly rural communities such as East Kent are expected to experience less use of Class A drugs than those living in urban areas. For cocaine dependence, a total of 10% of the participants were found to be dependent upon cocaine. A very similar percentage of respondents, slightly over 11%, were found to be users of cocaine. This indicates that around 90% of cocaine users are also dependent upon cocaine, with about 10% not dependent.

It has been stated that the percentage of alcohol use in the UK general population is higher, with an estimated prevalence of 85% (Robinson & Harris, 2009). This study identified that 42.01% of respondents were found to be current users of alcohol; this is in line with published data from studies reporting 52% (Best et al., 1998) prevalence of alcohol consumption in methadone-maintained individuals. It has been reported that the prevalence of hazardous drinking (identified using the AUDIT) in the general population in England was 24.2% (McManus, Meltzer H, Brugha, Bebbington P, & Jenkins, 2009). In comparison, the present study indicated that 14.2% of participants had AUDIT PC scores of 5 or above, indicating hazardous drinking; the remaining 85% of participants fell under the category of lower risk drinking. A study by Senbanjo et al. (2006) found a prevalence of 28.4% for hazardous drinking in a sample of methadone-maintained individuals (Senbanjo et al., 2007). The 2007 General Household Survey used the SADQ-C to identify the prevalence of alcohol

dependence in the general population in England, reporting a prevalence of alcohol dependence of 5.9%. Most recorded dependence was categorised as mild (5.55%), with relatively few adults reporting symptoms of moderate or severe dependence (0.4% and 0.1%, respectively) (McManus et al., 2009). In comparison, the present study found that the vast majority of patients have no dependence upon alcohol (93.49%), while no respondents were found to have mild dependence, only 2.37% of participants were moderately dependent upon alcohol, and 3.55% had severe dependence. Only a single respondent (0.59%) was found to have very severe dependence; the latter finding was in line with the published evidence.

When compared with the general population, a significant percentage of KCA methadone-maintained patients do not drink. There are few factors that can contribute to the decreased prevalence of alcohol use amongst methadone-maintained individuals at KCA.

In the general population, a significant fraction of opioid-dependent patients state that they do not drink, as they do not like the effects of alcohol. Another significant proportion might have had alcohol problems in the past and have moved over to opioids in an attempt to avoid the problems associated with excessive drinking (substitution of addiction). Also, those who are Hepatitis C positive may be abstaining from alcohol in line with KCA guidance, which emphasizes abstinence to avoid progression to liver disease. Regular monitoring of breath alcohol concentration before methadone is dispensed can serve as a deterrent for problematic alcohol use. Also, some relapsing heroin users have reported that Naltrexone Hydrochloride, previously prescribed to prevent relapse, contributed to the decrease of alcohol

cravings and further alcohol use. An integral package of care for methadone-maintained individuals, including consistent brief interventions for alcohol use, regular counselling sessions, and harm reduction and day programmes activities may have contributed to the decreased prevalence of alcohol use at KCA. Other factors may be that heroin is “the drug of choice” in the group of methadone-maintained individuals, and another important factor may be that some individuals maintained on methadone underreport their alcohol use for fear of putting their methadone prescription at risk. Despite the fact that alcohol-dependent patients contribute in a minor number to the overall amount of alcohol users, the fact that many of them complete alcohol detoxification before entering methadone-maintenance treatment may also contribute to the overall decreased number of current alcohol use amongst methadone-maintained individuals. This might be an interesting subject to investigate in a questionnaire-based study.

Limitations

The participants were not aware of the study hypothesis. Thus, it is rather unlikely that the results were influenced by selection bias. Individuals’ self-completed questionnaires were anonymised so that the respondents could not be identified; therefore, the possibility of information bias was greatly minimised, since it is not uncommon for patients to underreport poor health status, illicit drug use or alcohol use if they perceive that such a disclosure may have negative consequences for their treatment. The results may have been affected by information bias, since some individuals may have underreported the number of units of alcohol consumed on the AUDIT PC questionnaire as a result of misinterpreting ‘a drink’ as meaning a pint, a

can or a bottle of alcohol. However, this was taken into account, and clear instructions were printed on the questionnaires. Still, it has been reported that carefully collected self-reports of illicit drugs and alcohol can be as precise and may sometimes be more truthful than information obtained by other methods (Babor & Higgins-Biddle, 2000). Recall bias, on the other hand, may have not influenced the results, since this study investigated the self-reported data of current co-existent use of substances. The advantages of the present study, such as flexibility and cost effectiveness, may outweigh the above mentioned disadvantages.

Conclusions

The data presented indicate that a significant number of methadone-maintained individuals have coexisting substance-use disorders. The assessment of coexistent substance-misuse disorders in this group of individuals may be improved with the systematic use of screening tools such as SDS, AUDIT PC and SADQ-C. The prevalence of coexistent substance-use disorders amongst methadone-maintained individuals is higher than for individuals from the general population; despite this, the co-existence of some class A substances in individuals who are prescribed methadone in rural areas may be inferior to those prescribed methadone in the general population. The lower levels of alcohol use amongst methadone-maintained patients found in this study (as opposed to the individuals in the general population) also merit further investigation. While a specialist methadone prescribing service may not be focused on addressing those issues, they need to understand that addiction can be a result of a variety of biopsychosocial factors; therefore, the improvement of health outcomes resultant upon adequate treatment of coexisting substance-use disorders may

dramatically increase not only the treatment outcomes, but most importantly, the quality of life amongst this group of vulnerable individuals. A positive relationship between smoking cessation (within one year of entering treatment) and long-term outcomes has been established (Tsoh, Chi, Mertens, & Weisner, 2011). Thus, the optimisation of pre-existing resources (counselling intended for stimulant and tobacco users, brief alcohol interventions and contingency management for alcohol, plus partnership with other agencies and General Practitioners) is necessary to address the complex issues that interrelate and affect the quality of life amongst patients receiving methadone-maintenance treatment.

Competing Interests

The Authors declare that they have no competing interests.

Author contributions

OHG conceived the study, and was responsible for data collection, data entry and analysis. RP supervised the project, contributed towards study design and interpretation of data. Both authors helped prepare the paper for publication.

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